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Maternal Deaths in Himachal Pradesh, 2020–2024: A Review of Causes & Place of Death

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Abstract

Background: Maternal deaths remain a significant public health challenge, particularly in geographically difficult regions of India. While national and state efforts have improved institutional deliveries and antenatal care coverage, understanding where maternal deaths occur and their causes is critical to designing effective interventions. This study presents a descriptive analysis of maternal deaths reported in Himachal Pradesh from FY 2020 to 2024, focusing on place of death, underlying causes, and temporal trends.

Methods: A retrospective descriptive analysis was conducted using secondary data from the Health Management Information System (HMIS) report of Himachal Pradesh. All reported maternal deaths from FY 2020–2024 were included. Variables such as age, place of death (facility, home, transit), and cause of death were analyzed using frequencies and percentages.

Results: A total of 203 maternal deaths were reported during the reference period. Most occurred in women aged 25–30 years. Approximately 75% of deaths occurred in health facilities, followed by 17% in transit and 7% at home. The leading causes of death were postpartum hemorrhage (29.1%), cardiopulmonary complications (23.6%), and sepsis (19.7%). Districts with difficult terrain reported higher proportions of deaths in transit and at home.

Conclusion: Despite increased access to institutional deliveries, a substantial number of maternal deaths in Himachal Pradesh still occur outside of health facilities or from preventable causes. Strengthening emergency obstetric care, transport systems, and timely referrals—particularly in remote areas—remains critical to reducing maternal deaths in hilly regions.

Keywords: Maternal Deaths, Postpartum Hemorrhage, In-transit Maternal Deaths

Introduction

Maternal deaths remain a critical public health issue, particularly in low- and middle-income countries like India. Defined as the death of a woman during pregnancy or within 42 days of termination of pregnancy, these deaths reflect the effectiveness of maternal healthcare systems and highlight systemic gaps that still exist in the pathway of care [1]. While India has made considerable progress in improving institutional deliveries and antenatal care coverage, maternal deaths from preventable causes still occur—often due to delays in accessing timely and appropriate care. This is reflected in India's maternal mortality ratio of 93 per 100,000 live births, which remains above the Sustainable Development Goal (SDG) target of 70 [2], [3], [4].

Himachal Pradesh, a predominantly hilly state in northern India, faces unique challenges in maternal healthcare delivery. The state's difficult terrain, scattered population, and limited emergency transport systems often result in delays in reaching healthcare facilities, particularly during obstetric emergencies [4]. Such delays can lead to maternal deaths occurring not only within facilities, but also in transit or at home—especially in remote districts with limited infrastructure and workforce availability.

In addition to issues of access, the clinical causes of maternal deaths remain largely preventable. Obstetric haemorrhage (47%), pregnancy-related infections (12%), and hypertensive disorders (7%) remain the leading causes of maternal deaths in India, often exacerbated by inadequate emergency obstetric services, delayed referrals, and limited availability of skilled birth attendants [5],[6]. Understanding where and why maternal deaths occur is essential for designing localized and responsive health system interventions.

This study aims to describe the profile of maternal deaths reported in Himachal Pradesh between FY 2020 and 2024, with a specific focus on place of death and underlying medical causes. By identifying trends in these variables and highlighting regional disparities, the findings can inform evidence-based strategies to strengthen maternal healthcare delivery in challenging geographies.

Methods

Study Design: A retrospective descriptive study was conducted to analyze maternal deaths reported across all 12 districts of Himachal Pradesh over a four-year period from Financial Year (FY) 2020–2021 to FY 2023–2024.

Data Source: Data were obtained from the Health Management Information System (HMIS) reports maintained by the Department of Health and Family Welfare, Himachal Pradesh [7]. The dataset included all reported maternal deaths during the study period and provided information on the age of the deceased, place of death, and the clinically recorded cause of death.

Data Analysis: Descriptive statistical analysis was carried out. Frequency and percentage of the age groups distribution was calculated. The place of maternal death was classified into three categories: health facility, home, and in transit. Causes of death were grouped into major clinical categories, including postpartum hemorrhage, cardiopulmonary complications, sepsis, and others. All variables were reported as absolute numbers and percentages.

Results:

A total of 203 maternal deaths were reported across Himachal Pradesh between FY 2020–2021 and FY 2023–2024. The number of maternal deaths declined steadily over the study period, from 71 in FY 2020–21 to 30 in FY 2023–24.

Age Distribution: The majority (40.9%) of maternal deaths occured in the 25–30 years age group, followed by 33.5% in the 19–24 years group. Only 3.9% of deaths occurred in women aged 37–42 years. Age was unreported in 1.5% of cases. (Table 1)

Place of Death: Out of the total 203 maternal deaths, 75.4% occurred in health facilities, 17.2% in transit, and 6.9% at home. One case (0.5%) had an unrecorded place of death. Deaths in transit and at home were more frequently reported from remote and hard-to-reach districts. (Table 2)

Causes of Death: The leading clinical cause of maternal death was postpartum hemorrhage (n=59; 29.1%), followed by cardiopulmonary complications (n=48; 23.6%), and sepsis (n=40; 19.7%). Other causes included eclampsia (7.9%), anemia (3.0%), COVID-19 (4.9%), amniotic fluid embolism,

aspiration, abortion-related complications, and miscellaneous conditions such as RHD, neurological disorders, and hypotension. (Table 3 & 4)

Discussion:

This study analyzed maternal deaths reported in Himachal Pradesh over a four-year period, highlighting important patterns in age, place of death, and medical causes. While most deaths occurred in health facilities, a notable proportion still happened in transit (17.2%) or at home (6.9%), particularly in remote districts with limited transport and referral infrastructure.

The high proportion of facility-based deaths suggests that institutional delivery coverage in the state has improved. However, it also reflects continued gaps in emergency obstetric care, particularly in managing high-risk pregnancies and life-threatening complications. Similar patterns have been observed in states like Odisha and Madhya Pradesh, where maternal deaths persist in facilities due to delays in recognizing complications, inadequate staff training, and poor referral coordination [8], [9].

Deaths in transit remain a significant concern, particularly in geographically challenging regions such as Sirmaur and Chamba. These findings are consistent with studies that report distance from facilities, difficult terrain, and limited emergency transport as key barriers contributing to maternal mortality. Interventions such as maternity waiting homes near facilities and strengthening the referral transport network are crucial to prevent delays in reaching care [10].

Postpartum haemorrhage (PPH) was the leading cause of maternal deaths in this study, consistent with national-level findings that identify obstetric haemorrhage as the primary contributor to maternal mortality in India [11]. This underscores persistent implementation gaps in the availability of essential logistics, timely blood transfusion services, and the active management of the third stage of labor. Additionally, the prominence of cardiopulmonary complications and sepsis indicates systemic challenges related to postpartum monitoring, infection prevention, and timely clinical response, particularly in under-resourced and rural healthcare settings [8].

Although Himachal Pradesh reports a high institutional delivery rate—88% as per NFHS-5 (2019–21)—a significant share of maternal deaths still occur outside health facilities, including in transit and at home, particularly in remote and hilly districts [12]. These deaths point to enduring logistical, cultural, and awareness-related barriers that delay timely care-seeking. National reviews and public health literature highlight the role of birth preparedness, emergency transport planning, and community health worker support as key enablers in preventing such avoidable maternal deaths [13].

These findings reinforce the importance of not only increasing facility births but also strengthening the quality of emergency obstetric services, ensuring skilled care at peripheral levels, and reducing delays at all stages of maternal care.

Conclusion

This study highlights critical patterns in maternal deaths in Himachal Pradesh, with most occurring in health facilities, but a notable proportion in transit and at home—particularly in remote districts. Postpartum hemorrhage, cardiopulmonary complications, and sepsis were the leading causes.The findings emphasize the need for timely referral systems, strengthened emergency obstetric care, and improved transport infrastructure. Targeted interventions in high-risk and hard-to-reach areas are essential to reduce preventable maternal deaths and improve outcomes in hilly regions.

Table 1: Descriptive Characteristics of Maternal Deaths, Himachal Pradesh (FY 2020–2024)

Age Group	Number of Deaths	Percentage (%)
19–24 years	68	33.5
25–30 years	83	40.9
31–36 years	41	20.2
37–42 years	8	3.9
Missing	3	1.5

Table 2: Place of Maternal Death, Himachal Pradesh (FY 2020–2024)

Place of Death	Number of Deaths	Percentage (%)
Health Facility	153	75.4
In Transit	35	17.2
At Home	14	6.9
Unknown	1	0.5

Table 3: Causes of Maternal Deaths in Himachal Pradesh (FY 2020–2024)

Cause of Death	Number of Deaths	Percentage (%)
Postpartum Hemorrhage (PPH)	59	29.1
Cardiopulmonary Complications	48	23.6
Sepsis	40	19.7
Eclampsia	16	7.9
Anemia	6	3.0
COVID-19	10	4.9
Amniotic Fluid Embolism	4	2.0
Aspiration	4	2.0
Abortion-related	2	1.0
Others*	14	6.9

* Neurological disorders/brain tumor (n=2), pulmonary tuberculosis (n=1), hypotension (n=2), hepatitis (n=1), brought dead (n=2), suicide/sudden collapse (n=1), epilepsy (n=1), uterine prolapse (n=1), scrub typhus (n=1), myocardial infarction (n=1), multi-organ failure (n=1).

Table 4: Place of Maternal Death stratified by Districts of Himachal Pradesh (FY 2020–2024)

District	Health Facility	At Home	In Transit	Unknown
Bilaspur	6	0	0	0
Chamba	9	0	3	0
Hamirpur	7	2	0	0
Kangra	60	3	7	0
Kullu	3	0	2	1
Mandi	17	3	5	0
Shimla	15	0	2	0
Sirmaur	17	5	11	0

Solan	12	1	1	0
Una	7	0	4	0

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